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ADDITIONS TO THE LICHEN-FLORA OF SOUTHERN  
CALIFORNIA. No. 2.

H. E. HASSE.

(First paper see BRYOLOGIST XI: 1, 1908.)

**Sclerophyton Californicum** (Tuck.) Hasse comb. nov.

*Chiodecton Californicum* Tuck. Syn. N. A. Li. Part II, 1888, p. 135.

*Sclerophyton* Eschw. A. Zahlbruckner "Ascolichenes" in Engler & Prantl, Die Natürl. Pflanzenf. 1907, p. 105.

Thallus "pale ochroleucous," thickly crustaceous, darkening with age. Apothecia numerous, crowded, the thecial structure composed of a stroma of several apothecia surrounded by a turgid, persistent thalline margin; disk dull black but densely pruinose and so concolorous with the thallus, from round to angular, variously difform; thallus at the circumference inclining to become lobular and limited by a dull black hypothalline line; epithecium subgranulose and but little darker than the thecium; this latter is  $0.140\mu$  high, pale sordid yellow giving no reaction with iodine; paraphyses interwoven, slender; hypothecium dark brown; asci clavate, thick walled; spores in eight's, oblong ellipsoid with blunted ends, brown, 6 to 8 locular, the cells cylindric, length of spores  $0.020$  to  $0.030\mu$  and  $0.005$  to  $0.007\mu$  thick. The gonidial layer is composed of *Chroolepus*, a algae, the cells are irregularly round or oblong, forming a branching structure. Thallus with KHO no reaction, with Ca (Cl O) 2 the cortex gives a reddish, the medullary layer no reaction.

Type locality "San Diego, Dr. E. Palmer." It occurs near Newport, Orange Co., on *Lycium Californicum* Nutt., and the writer recently found it on the same host at Point Loma near San Diego, possibly Dr. Palmer's locality. Like its relatives *Rocella*, *Dendrographa* and *Dirina*, it evinces a predilection for a maritime location (A. Zahlbruckner, Bulletin Torrey Bot. Club, 27, Dec. 1900, p. 642 and O. V. Darbishire, Monographie Rocellorum, 1898, 40).

**PERTUSARIA NOLENS** Nyl.

Leighton Li. Flor. Gr. Brit. 3d. ed. 1879, p. 235.

A. Hue Addenda Nova, 1886, No. 834.

Crombie Brit. Lich. I. 1894, p. 508.

Thallus thin, smooth, leaden, grey or dull ashy-grey, finely rimose, areolate, no reaction with KHO or Ca (Cl O) 2, with determinate outline and a pale hypothallus; apothecia one or sometimes two in an areole, slightly elevated, minutely crateriform, roundish or mostly irregular in shape, and by the fissured thalline margin appearing stellate; disk black; thecium colorless; paraphyses slender, branched and interwoven; asci cylindric-oblong,  $0.120$  to  $0.140\mu$  long,  $0.032$  to  $0.036\mu$  thick; spores in eight's, ellipsoid, pointed or acuminate at each end,  $0.032$  to  $0.042\mu$  long and  $0.014$  to  $0.022\mu$  thick, the endospore mostly smooth or scarcely wrinkled; reaction of paraphyses with iodine yellow and only the asci blue.

On schistose rocks in Sepulveda and Rustic Cañon, Santa Monica Moun-

tains. From its similarity to *Lecanora laevata* Nyl. it is easily overlooked and so far as known, has not heretofore been reported from North America.

**LECIDEA** (Section *Biatora*) **FUSCESCENS** Sommerf.

*Lecidea* (*Biatora*) *fuscescens* Sommerf. Fries Li. Scand. I, 1871, p. 461.

*Biatora fuscescens* (Sommerf.) Th. Fr. Tuck. Syn. II, p. 25.

Thallus crustaceous of minute, whitish or ashy grey, separate, flat scales scattered over a dark hypothallus; apothecia small, 0.3 to 0.5 mm. wide, disk dull black, when moistened dull brown, the margin thin, erect, dark ash colored or brownish black but finally disappearing and the disk then convex: epithecium subcontinuous, bluish-grey; thecium 0.048 $\mu$  high; paraphyses loosely coherent, hypothecium colorless; asci cuneate, 0.042 $\mu$  long and 0.010 $\mu$  thick; spores in eight's, colorless, simple, ovoid-ellipsoid or semi-globular, 0.006 to 0.010 $\mu$  long, and 0.004 to 0.007 $\mu$  thick; hymenial gelatine blue with iodine changing to sordid greenish-blue.

On bark of *Ribes hesperium* in cañons of Santa Monica Mts.

**LECIDEA** (Section *Biatora*) **CADUBRIEA** (Mass) Nyl.

Th. M. Fr. Li. Scand. I, 1871, p. 468.

Thallus white, thin, effuse, subgranulose; apothecia sessile, small, flat, black with a shade of red-brown, margin persistent, black; epithecium brown, granulose; thecium colorless, 0.060 $\mu$  high; paraphyses coherent, slightly capitate and brown at the tips; hypothecium colorless; asci narrowly clavate, about 0.044 $\mu$  high; spores in eight's, ellipsoid, 0.008 to 0.010 $\mu$  long, and 0.0035 to 0.0040 $\mu$  thick; hymenial gelatine blue with iodine, the globular heads of the paraphyses retaining their brown color.

On *Salix*, Topanga Cañon, Santa Monica Mts.

**CATILLARIA** (Section *Biatorina*) **LENTICULARIS** (Ach.) Th. Fr. var. **VULGARIS** (Korb.) Th. Fr.

*Lecidea lenticularis* Ach. f. *vulgaris* (Korb.) Leighton Li. Flor. Gr. Brit. 3d. ed. 1879, p. 335.

**CATILLARIA** (*Biatorina*) **LENTICULARIS** (Ach.) Th. Fr. a. **VULGARIS** (Korb.) Th. Fr. Th. M. Fr. Lich. Scand. I, 1871, p. 568.

Thallus crustaceous, dusky grayish-brown, thin, indeterminate, surface granular, no reaction with KHO or Ca(Cl O) 2; apothecia dull brownish-black, sessile, disk flat with a thin, slightly elevated, entire, concolorous margin, finally convex and immarginate; epithecium granulose, brownish-black; thecium colorless, 0.060 $\mu$  high, stained blue with iodine, but epithecium and hypothecium retaining their natural color; paraphyses subcoherent and finally free, with globular, dark brown heads; hypothecium brown of lighter shade than the epithecium; asci clavate; spores in eight's, bilocular, narrowly- or fusiform-ellipsoid, acuminate at both ends, 0.007 to 0.012 $\mu$  long and 0.002 to 0.004 $\mu$  thick. Medullary hyphae not stained by iodine.

On schistose rock, Santa Monica Mts.

**Catillaria glauco-nigrans** (Tuck.) Hasse n. comb.

*Biatora glauco-nigrans* Tuck. Syn. N. A. Lich. II, 1888, p. 31. Ascolichenes A. Zahlbruckner in Engler & Prantl, 1907, p. 129.

Thallus ash colored with a shade of brown, crustaceous, indistinctly subgranulose; hypothallus obscure; apothecia closely sessile, black, minute to small, the larger plano-convex with a concolorous, persistent margin; epithecium of discrete, blackish-brown globules; thecium from  $0.060$  to  $0.064\mu$  high, colorless, reacting blue with iodine; paraphyses free, some of them thickened at the tips and with dark, globular heads; hypothecium brown, of lighter shade than the epithecium; asci clavate,  $0.040$  to  $0.044\mu$  long and  $0.007$  to  $0.008\mu$  thick; spores in eight's, colorless, bilocular, ellipsoid,  $0.006$  to  $0.011\mu$  long and  $0.002$  to  $0.003\mu$  thick.

On *Rhus diversiloba* T. & G. in cañons of the Santa Monica Mts. The similarity in the color of the thallus with that of the bark of the host and the minute apothecia tend to make this a very inconspicuous plant.

BACIDIA ENDOLEUCA (Nyl.) Kicix.

*Lecidea milliaria* Fr. var. *endoleuca* Leight. Leighton Li. Flor. Gr. Brit. 3d. edit. 1879, p. 363.

*Biatora atrogrisea* (Delis.) Hepp. Tuck. Syn. Li. N. A. II. 1888, p. 44.

*Bacidia* (Section *Eubacidia* A. Zahlbr.) *endoleuca* (Nyl.) Kickx. Ascolichenes A. Zahlbr. in Engler & Prantl, 1907, p. 136.

Thallus smooth, rimose, light greenish-greyish, indeterminate, epiphlaeoidà; hypothallus indistinct; apothecia small, brown, darkening to brownish-black and from flat to convex; margin indistinct; when moist the disk is light brown to brown and appears semi-translucent. Epithecium continuous, a thin, pale, bluish-grey line that with KHO is tinted a violaceous; thecium  $0.052$  to  $0.060\mu$  high, with iodine it and the epithecium are stained blue then reddish brown; paraphyses loosely coherent, clavate at the apices; hypothecium yellow; asci clavate; spores in eight's, acicular straight, one end slightly thickened, indistinctly four to plurilocular,  $0.028$  to  $0.042\mu$  long and  $0.005$  to  $0.003\mu$  thick.

On *Acer macrophyllum* Pursh. in cañons of the San Gabriel Mts.

ACAROSPORA GLEBOSA Korb.

*Acarospora glebosa* Korb. Th. M. Fr. Lich. Scand. I, 1871, p. 214.

*Acarospora glebosa* Korb. Ascolichenes A. Zahlbr. in Engl. & Prantl, 1907, 153.

Thallus composed of round, reddish-brown, convex squamules not exceeding one millimeter in width, somewhat scattered or approximate and then the squamules angular and rimose; apothecia small, punctiform, depressed, mostly single at the apex of the squamule, seldom two, or the disk is slightly enlarged and then concave, dull black with a rim of thalline margin; epithecium continuous, dark reddish brown; thecium colorless,  $0.0120\mu$  high, stained blue with iodine, particularly the hypothecium, being dark blue while the epithecium gives no reaction; paraphyses moderately stout, loosely coherent but adglutinated at the tips; hypothecium colorless; asci ventricose; the sac thickened at the top,  $0.100\mu$  long,  $0.036\mu$  thick; spores 24 in each asci, bluntly ellipsoid,  $0.011$  to  $0.018\mu$  long, and  $0.005$  to  $0.008\mu$  thick; the *Protococcus* gonidia form a thick subcortical layer that also extends under the hypothecium throughout.

On sand stone, Santa Monica Mts. Perhaps not heretofore reported from North America.

Superficially greatly like some of our saxicolous *Heppia*.

*BUELLIA RETROVERTENS* Tuckerm. Syn. N. A. Li. II, 1888, p. 89.

Thallus of small, whitish, round to angular convex squamules, separate and even more or less scattered, their circumference sometimes crenulate or sublobular. Reaction of cortex with KHO yellow, Ca (Cl O) 2 gives no reaction; hypothallus black; apothecia one half to one millimeter wide, sub-immersed, becoming sessile; disk black, naked, from flat with a thin sub-crenulate, concolorous margin, becoming convex and the margin obscured; epithecium subcontinuous, dark brown; thecium colorless, with iodine blue; paraphyses coherent, clavate at the brown tips; hypothecium brown, nearly as dark as the epithecium; asci inflated clavate to subventricose; spores in eight's, bilocular, ellipsoid and oblong-ellipsoid, brown, 0.013 to 0.016 $\mu$  long, 0.006 to 0.008 $\mu$  thick.

On trap rock, Santa Monica Mts.

Sawtelle, California.

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### SOME RARE ABNORMALITIES IN LIVERWORTS.

W. C. COKER.

In looking over hundreds of young sporophytes from a luxuriant colony of *Aneura pinguis* at Chapel Hill, North Carolina, I found two cases where two sporophytes were enclosed in a single calyptra. A longitudinal section of one of these twin sporophytes, represented in Fig. 1., shows clearly that the calyptra is compound, originating from two fertilized archegonia standing close together. The necks of the archegonia are still plainly visible and there is a partition between the sporophytes extending from the top to about half way down. When we consider the manner in which the calyptra of *Aneura* originates the absence of a partition below is easy to understand. It is known that the venter of the archegonium contributes but slightly to the calyptra in this species, the larger part being formed by an upgrowth of the "torus" tissue on which the archegonia were borne.

The tissue which at first completely separated the young sporophytes was pierced at a certain stage by their approach to each other below. Continued growth at the base of the calyptra then elevated the partition leaving the lower parts of the sporophytes in a common cavity. It is evident, therefore, that this abnormality did not originate from a single archegonium which contained two eggs, such as I have described for *Mnium* (Bot. Gazette, Vol. 35, 1903) and Miss Bliss, for *Polytrichum* (Bot. Gazette, Vol. 36, 1903).\*

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\*For examples of two capsules or two entire sporophytes from one archegonium in mosses, and reference to literature see Györfy in Hedwigia Vol. 46, p. 202, 1907.

For many abnormalities in the archegonia of *Mnium* see Holferty in Bot. Gaz. Vol. 37, p. 106, 1904.